

# **Improved Structure Water Sprayer Long Tube and Water Pipe Connector**

## **BACKGROUND OF THE INVENTION**

### **1) FIELD OF THE INVENTION**

The invention herein relates to an improved structure water sprayer long  
5 tube and water pipe connector that improves upon the easy misplacement  
drawbacks of conventional water sprayer long tube and connector conjunction  
structures and the lack of a simple water sprayer angle adjustment capability, with  
the structure of the invention herein providing for the effective improvement of the  
conventional shortcomings included among the innovative features of the present  
10 invention.

### **2) DESCRIPTION OF THE PRIOR ART**

Conventional water sprayers, as indicated in FIG. 1, FIG. 2, and FIG. 3, are  
comprised of a sprayer head 2 having a numerous fine water output holes in a  
patterned arrangement and a long tube 3 conjoined to the bottom end of the sprayer  
15 head 2, enabling the bottom end of the long tube 3 of the sprayer head 2 to be  
coupled to the high pressure water flow of a water pipe connector (a conventional  
structure not shown in the drawings) and thereby providing a structure for the  
stoppage and control of the water flow; a sleeve 4 is disposed between a connector

5 and the water pipe connector to serve as the switching control of the connector 5 as well as a conjunction structure; threads 41 are formed along the interior section of the sleeve 4 and at its top end is the inward extending lip 421 of an insertion hole 42 and, furthermore, the said insertion hole 42 provides for inserting the bottom end of the water sprayer long tube 3, and also formed at the bottom end of the water sprayer long tube 3 is a flange 31, such that when the said flange 31 is constricted by the inward extending lip 421 at the top end of sleeve 4, separation from the top end of the sleeve is precluded and, finally, a water sealing ring 43 is ensconced in the interior section of the sleeve 4; serving as a switchable component, the connector 5 is equipped at the approximate center of its interior section with a partition plate 51 and, furthermore, a water output hole 511 is formed in the center of the partition plate 51 and respectively installed from its bottom end is a water stoppage and controlling ball valve 52 and a water sealing ring 53, with external threads 54 formed along its outer top end providing for fastening to the threads 41 formed along the interior section of the sleeve 4, and internal threads 55 are formed along its interior bottom section to enable coupling to the water pipe connector (not shown in the drawings); given the assembly of the said structure, when entire water sprayer is to be coupled to the high pressure water flow of the water pipe, the water pipe connector only has to be directly fastened to the internal threads 55 formed along its interior bottom section of the

connector 5 to achieve effective coupling.

However, in the said type of structural assembly that provides for the coupling of the long tube 3 of the water sprayer to the water pipe connector; first, since the external threads 54 at the upper section and exterior of the connector 5 are fastened to the sleeve 4 and the connector 5 and the sleeve 4 are two components, according to the experience of the applicant gained while actually engaged in the production and marketing of such devices, a major shortcoming is that the said connector 5 is easily disconnected and misplaced; second, since the external threads 54 along the top section of the connector are fastened to the threads 41 formed along the interior section of the sleeve 4 to conjoin them into a single structural entity, such that when the high pressure water flow initially passes through the water pipe connector and then through the interior section of the connector 5, through the sleeve 4, through the long tube 3, and is finally discharged from the front end surface of the sprayer head 2, the high pressure water flow does not result in leakage from the conjoinment between the connector 5 and the sleeve 4, enabling the upper section of the connector 5 to remain tightened to the threads 41 formed along the interior section of the sleeve 4 such that the top surface of the connector 5 is firmly against the water sealing ring 43 inside the sleeve 4 and, furthermore, since the flange 31 formed at the bottom of the long tube 3 originally constrained by the inward extending lip 421 at the top

end of the sleeve similarly remains tightly secured, the entire long tube 3 is firmly fixed to the end of the sprayer head 2, enabling the entire water sprayer to be tightly fastened together such that when the internal threads 55 formed along the interior bottom section of the water sprayer are screw fastened to the threads on the water pipe connector, the water sprayer angle of the entire coupled water pipe connector is at a set angle and the said angle is not necessarily the grasping angle preferred by the user, resulting in inconvenience during actual sprayer utilization, a shortcoming that awaits improvement.

Therefore, in view of the existent said shortcomings of the conventional structure that await improvement, the inventor of the invention, based on years of experience gained from engagement in various water application, landscaping, and other related hardware marketing, production, and assembly as well as after-sales feedback from consumers, conducted extensive research informed by the said factors that culminated in the development of the invention herein which is hereby submitted for patent application.

## **SUMMARY OF THE INVENTION**

The primary objective of the invention herein is to provide an improved structure water sprayer long tube and water pipe connector, specifically referring to the arrangement between the long tube and the water pipe connector of the

water sprayer, wherein directly disposed from the water inlet end in respective order are a Teflon water sealing ring, a ball valve that opens or closes the path of water flow, and another Teflon water sealing ring that couple the said two components together; of which, the opening of the water outlet end is of a smaller inner diameter than that of the opening at the water inlet end, and a water sealing ring is ensconced along the inner diameter edge of the said water outlet end and, furthermore, after the long tube is installed into the inner diameter of the water outlet end, a flange formed at the bottom end of the long tube in the water inlet end of the connector is secured and constrained inside the connector, with the constraining of the long tube flange of the water sprayer enabling it to become assembled with the connector into a single structural entity that cannot be disconnected, such that after the water sprayer bottom end is first assembled to the connector and when the connector bottom end is assembled to the water pipe connector for utilization, in addition to allowing the user to easily adjust the angle of the water sprayer as desired, the separation and loss of the entire connector from the long tube of the water sprayer is effectively prevented, which is among the innovative features of the invention herein.

Another objective of the invention herein is to provide an improved structure water sprayer long tube and water pipe connector that provides for a connector between the long tube of the water sprayer and the water pipe connector

and after the long tube of the water sprayer is inserted into the opening of the water outlet end, since an outwardly extending flange is formed at its bottom end, this constrains it at the interior section, following which a Teflon water sealing ring, a ball valve that controls water by opening closing the path of flow, and another  
5 Teflon water sealing ring are respectively installed in the water inlet end to assemble a connector structure; additionally, given the water sealing washers ensconced inside the opening of the water outlet end and, furthermore, the friction-resistance of Teflon, when the interior bottom section of the connector is fastened to the water pipe connector, the long tube of the said water sprayer can as a result  
10 be easily adjusted to a desired utilization angle to facilitate spraying operation performance, which is among the innovative features of the invention herein.

To further understand the structure, innovative features, and operation of the invention herein for purposes of review and reference, the brief description of the drawings below is followed by the detailed description of the invention.

## 15 **BRIEF DESCRIPTION OF THE DRAWINGS**

Figure 1 is an isometric drawing of a conventional water sprayer as assembled to the sleeve and the connector.

Figure 2 is an exploded drawing of the long tube, sleeve, and connector of a conventional water sprayer.

Figure 3 is a cross-sectional drawing of the long tube, sleeve, and connector of a conventional water sprayer.

Figure 4 is an exploded drawing of the structural details between the long tube and the connector of the water sprayer invention herein.

5        Figure 5 is a cross-sectional drawing of the structural details between the long tube and the connector of the water sprayer invention herein.

#### **DETAILED DESCRIPTION OF THE INVENTION**

Referring to FIG. 4 and FIG. 5, the structure of the conjoined long tube 3 and water pipe connector of the invention herein consists of a connector 6  
10    comprised of internal threads 61 tapped at the bottom section of its water inlet end followed in respective order by a Teflon water sealing ring 62, a ball valve 63 that opens or closes the path of water flow, and a Teflon water sealing ring 64 that couple the said two components together; the most innovative aspect of the invention herein is that the opening of the water outlet end 65 is of a smaller inner  
15    diameter than that of the opening at the water inlet end, and a water sealing ring 66 is ensconced along the inner diameter edge of the said water outlet end 65 and, furthermore, after the long tube 3 is installed into the inner diameter of the water outlet end 65, a flange 31 formed at the bottom end of the long tube 3 in the water inlet end of the connector 6 is secured and constrained inside the connector 6, with

the constraining of the long tube 3 flange 31 of the water sprayer enabling it to become assembled with the connector 4 into a single structural entity that cannot be disconnected, such that after the water sprayer bottom end is first assembled to the connector 6 and when the connector 6 bottom end is assembled to the water  
5 pipe connector for utilization, in addition to allowing the user to easily adjust the angle of the water sprayer desired, the separation and loss of the entire connector 6 from the long tube 3 of the water sprayer is prevented, thereby effectively enhancing the practicality of the present invention.

In summation of the foregoing section, since the invention herein is simpler  
10 and more advantageous than the conventional structure and, furthermore, complies with new patent application requirements, the present invention is submitted to the patent bureau for review and the granting of the commensurate patent rights.